

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Invertebrate Abstract

Element Code: IMGASC9010

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Sonorella allynsmithi*
COMMON NAME: Squaw Peak Talussnail
SYNONYMS: *Maricopella allynsmithi*
FAMILY: Helminthoglyptidae

AUTHOR, PLACE OF PUBLICATION: W.O. Gregg and W.B. Miller. 1969. A new *Sonorella* from Phoenix, Arizona. Nautilus 83 (3): 90-93.

TYPE LOCALITY: East side of Squaw Peak Road about 0.3 miles from Lincoln Drive, Phoenix, Arizona.

TYPE SPECIMEN: Holotype: Academy of Natural Sciences of Philadelphia 314853.

TAXONOMIC UNIQUENESS: Genus *Sonorella* divided into four complexes by Miller. Within these complexes there are about 60 species and subspecies of *Sonorella* within Arizona. *S. allynsmithi* belongs to the *Sonorella rooseveltiana* complex, which contains two species and one subspecies (Bequaert and Miller 1973). In 1992, a new subspecies of *S. allynsmithi* found as well as a new species of *Sonorella*. Appropriate complex for this new species not known at this time (1995).

DESCRIPTION: Land snail with small (to about 13.0 mm (0.52 in.) diameter), thin, glossy white globose shell with brownish-gray tinge. Light-brown spiral band on rounded shoulder and approximately 4 to 4 1/4 whorls. Snail has very dark gray to black body. For helminthoglyptidae, the buccal mass is small and spheroidal. The gastric caecum and the rectal caecum are absent. The radular teeth are endocones and ectocones retained in marginal teeth but these are serrated, on quadrate or rectangular basal plates or the central and lateral teeth may be lacking endocones and ectocones but with a broad mesocone. The prolonged cuspid head on radular teeth may or may not be present. The cephalic shield is reduced, defined only by vestigial grooves. The hyponotum is absent. Inferior tentacles are present. The eye position is at the tip of more or less elongate cephalic tentacle. The tentacular nerve is bifurcated. (Barker 2001). This is only land snail fitting this description in Phoenix Mountains area, though it could be confused with other *Sonorella* found in McDowell Mountains or further eastward.

AIDS TO IDENTIFICATION: Reproductive structures must be dissected out of snail and compared to ascertain positive identification.

ILLUSTRATIONS:

TOTAL RANGE: Squaw Peak (Piestewa Peak) Park and Mummy Mountain, Maricopa Co. Arizona.

RANGE WITHIN ARIZONA: See "Total Range."

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Development within shell takes about a month. Eggs seem to have less ability than mature snails to withstand lengthy dry spells; true for immature snails as well. It takes four or more years to reach reproductive maturity. They have very porous epidermis.

REPRODUCTION: Hermaphroditic, "each mating encounter usually results in two pregnancies" (Hoffman 1994). Fertilization and egg laying takes several days. If rains are short-lived, snails may be forced to wait for next rain to lay eggs. For helminthoglyptidae, embryonic brooding may or may not be present and they can be oviparous or viviparous. The eggs are single, not embedded in a jelloid/mucoid mass. The egg capsule could be partially calcified, with calcite crystals embedded in jelly layers but not forming a distinct shell or it could be calcified forming a distinct shell. The larval development has no trochophore or veliger stages, there is direct development in the egg. The larval operculum is absent. The genital orifices in the male and female are fused or nearly so in cephalic region, near right ocular tentacle. The extrapallial sperm duct is a closed duct, free in the body cavity. The lumen of the penis is lacking of spines. (Barker 2001).

FOOD HABITS: Fungal hyphae and decomposing plant matter that filters down among rocks and soils. For helminthoglyptidae the openings of the digestive gland lobes are more or less adjacent, openings are intestinal. The stomach is greatly simplified, with very poorly developed musculature. The diagonal intestinal folds are absent. The intestinal valve is absent. (Barker 2001).

HABITAT: "All suitable north facing talus slopes, a total of at least fourteen, within Squaw Peak Park. Also, two talus slopes on Mummy Mountain" (Hoffman 1994). Lower Sonoran Life-Zone under conditions of extreme aridity at low elevations (Bequaert and Miller 1973). Because of porous epidermis, snails must inhabit very deep, open, talus piles or rockslides where they can seal shell apertures to solid rock while being protected from heat and dryness by rock layers and plants above. Requires calcium carbonate from which to build shells and to buffer carbonic acid created from exhaled water and CO₂. Without source of calcium carbonate, carbonic acid would build to high levels as snails estivate within sealed shells for many months at a time. Land snails in xeric environments obtain calcium carbonate from limestone. Therefore, snail limited to relatively steep slopes where limestone talus breaks off forming deep piles or slides. Snails cannot survive where decomposing granite, sand or mud fills spaces between lower layers of igneous rock.

ELEVATION: 1,100 - 3,900 ft (336 - 1,190 m) according to Bequaert and Miller (1973).

PLANT COMMUNITY: They may be found associated with the following plant species: *Carnegia gigantea* (saguaro), *Parkinsonia microphylla* (little-leaf paloverde), *Encelia farinose* (white brittle-bush), *Bromus rubens* (foxtail brome), *Rhynchityrum roseum*, *Larrea tridentata* (creosote bush), *Lupinus sparsiflorus* Mohave lupine), and *Sphaeralcea* sp. (globe-mallow). (Hoffman 1994).

POPULATION TRENDS: Unknown.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1994]
STATE STATUS: None
OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)

MANAGEMENT FACTORS: Human encroachment is main problem. However, if park policy regarding usage remains the same, population will remain stable.

Threats: restricted distribution with associated potential for extinction due to chance events; human encroachment by hiking/climbing off trails and disrupting talus; housing development.
Management needs: educational signs in parks to alert hikers of activities that may be detrimental to the talussnail; periodic monitoring of snail populations and their habitat.

PROTECTIVE MEASURES TAKEN: Encourage hikers to stay on trails, discourage climbing and digging in talus.

SUGGESTED PROJECTS: Further surveys and subsequent analysis of snails needed.

LAND MANAGEMENT/OWNERSHIP: City of Phoenix (Phoenix Mountains Preserve); City of Paradise Valley.

SOURCES OF FURTHER INFORMATION

REFERENCES:

Barker, G.M. 2001. The Biology of Terrestrial Molluscs. CABI Publishing UK. Pp: 139-144.
Bequaert, J.C. and W.B. Miller. 1973. The mollusks of the arid southwest. The University of Arizona Press. Tucson, Arizona. Pp. 23, 125.

- Hoffman, J.E. 1994. Status survey for the Squaw Park Talussnail *Sonorella allynsmithi*. Prepared for U.S.Fish and Wildlife Service, Ecological Services, Contract Number 20181-1-1422.
- Hoffman, J. 2000. *In* Personal communication from S. Schuetze (AGFD) to Nicole Capuano (NatureServe).
- Hoffman, J. Obtained 2003. Printout from personal database on type localities of snails. NatureServe Explorer: An online encyclopedia of life [web application]. 2003. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: <http://www.natureserve.org/explorer>. (Accessed: November 19, 2003).
- Turgeon, D.D. et al. 1998. Common and Scientific names of aquatic invertebrates from the United States and Canada: Mollusks. 2nd Edition. American Fisheries Society Special Publication 26, Bethesda, Maryland. P. 526.
- USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.
- USDI, Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species; Proposed Rule. Federal Register 59(219): 59007.
- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species. Federal Register 61(40): 7596-7613.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

James Hoffman - Tucson, Arizona
Walt Miller - University of Arizona (Retired), Tucson, Arizona

ADDITIONAL INFORMATION:

According to Jim Hoffman, the name *Maricopella allynsmithi* is not widely accepted in Arizona. He questions the genetic work that split out several of the *Sonorella*'s to *Maricopella*'s. (Hoffman 2000).

Revised: 1995-01-09 (DBI)
1997-03-03 (SMS)
2003-12-04 (AMS)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX (= **year of last revision as indicated at end of abstract**). X...X (= **taxon of animal or plant**). Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.